

PATENT

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Claims:

1. A fluid dynamic bearing defined by the interface of a hub and a sleeve, the hub having a vertical shaft portion configured to rotate within the sleeve, and a horizontal body portion configured to rotate above the sleeve, the bearing comprising:
 - a first gap region between the shaft portion of the hub and the sleeve;
 - a second gap region between the horizontal body portion of the hub and the sleeve;
 - a volume of lubricating fluid within the first gap; and
 - an oil pumping groove pattern disposed at least partially along the second gap, the oil pumping groove pattern impelling oil toward the shaft when the shaft portion of the hub is rotated within the sleeve.
2. The fluid dynamic bearing of claim 1, wherein:
 - the first gap region comprises a substantially vertical gap; and
 - the second gap region comprises a substantially horizontal gap portion.
3. The fluid dynamic bearing of claim 1, further comprising a third gap region between the hub and an outer diameter portion of the sleeve.
4. The fluid dynamic bearing of claim 3, wherein the third gap is configured to form a capillary seal.
5. The fluid dynamic bearing of claim 1, wherein the hub further comprises a radial shoulder for receiving a disc.
6. The fluid dynamic bearing of claim 5, wherein the hub and sleeve are part of a spindle motor for a disc drive system.

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7. The fluid dynamic bearing of claim 1, wherein the shaft portion is adapted to rotate within the sleeve on a counterplate.

8. The fluid dynamic bearing of claim 1, wherein the oil pumping groove pattern defines at least one groove formed in a bottom surface of the horizontal body portion of the hub.

9. The fluid dynamic bearing of claim 1, wherein the oil pumping groove pattern defines at least one groove formed in a top surface of the sleeve.

10. The fluid dynamic bearing of claim 1, wherein the oil pumping groove pattern defines a spiral pattern.

11. A fluid dynamic bearing defined by the interface of a shaft and a sleeve, wherein the sleeve is fitted with a hub and configured to rotate around the shaft, and the shaft is fitted with a shield under which the sleeve rotates, the bearing comprising:

a first gap region between the shaft and the sleeve;

a second gap region between the shield and the sleeve;

a volume of lubricating fluid within the first gap; and

an oil pumping groove pattern disposed at least partially along the second gap, the oil pumping groove pattern impelling oil toward the shaft when the shaft portion of the hub is rotated within the sleeve.

12. The fluid dynamic bearing of claim 11, wherein:

the first gap region comprises a substantially vertical gap; and

the second gap region comprises a substantially horizontal gap portion.

13. The fluid dynamic bearing of claim 11, further comprising a third gap between the shield and an outer diameter portion of the sleeve.

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14. The fluid dynamic bearing of claim 13, wherein the third gap is configured to form a capillary seal.
15. The fluid dynamic bearing of claim 11, wherein the hub further comprises a radial shoulder for receiving a disc.
16. The fluid dynamic bearing of claim 15, wherein the hub, sleeve, and shaft are part of a spindle motor for a disc drive system.
17. The fluid dynamic bearing of claim 11, wherein the sleeve is adapted to rotate around the shaft on a base adapter.
18. The fluid dynamic bearing of claim 11, wherein the oil pumping groove pattern defines at least one groove formed in a bottom surface of the shield.
19. The fluid dynamic bearing of claim 11, wherein the oil pumping groove pattern defines at least one groove formed in a top surface of the sleeve.
20. The fluid dynamic bearing of claim 11, wherein the oil pumping groove pattern defines a spiral pattern.